CLAIMS

What is claimed is:

1. A system, comprising:

      a processor that executes an algorithm;

      a hardware unit that comprises one or more physical resources; and

      an abstraction layer implemented by said processor that facilitates communication between the algorithm and the hardware unit through the use of a plurality of functions and that creates a reference to a logical resource that is associated with a corresponding physical resource,

      wherein each logical resource is associated with at least one private state that represents the most recently configured settings of the logical resource.

2. The system of claim 1 wherein the reference comprises a pointer to the logical resource.

3. The system of claim 1 wherein the plurality of functions are selected from the group consisting of command functions that request and grant the identifier to the algorithm, configuration functions that pre-compute and store register values and algorithm settings, synchronization functions that align the logical resource with the physical resource, and a combination thereof.

4. The system of claim 1 wherein the plurality of functions comprise command functions that request and grant the identifier to the algorithm.

5. The system of claim 4 wherein the command functions comprise a function that monitors the physical resources and updates a corresponding vector table that associates the reference to a logical resource with a memory location of function optimized for a current operation.

6. The system of claim 4 wherein the command functions comprise a function that does not write to a register associated with the physical resource if a previous use of the physical resource has left the register in a state compatible with a current operation.

7. The system of claim 4 wherein the command functions comprise a function that branches to a function that is optimized for the configured settings based upon the a vector table that associates the reference to a logical resource with a memory location of the function that is optimized.

8. The system of claim 7 wherein the function that branches and the function that is optimized for the configured settings comprise functions with identical function signatures.

9. The system of claim 1 wherein the plurality of functions are selected from the group comprise configuration functions that pre-compute and store register values and system state settings.

10. The system of claim 9 wherein the configuration functions comprise a function that selects and stores an address of a function that is optimized for a current operation.

11. A method for achieving high-performance hardware abstraction, comprising:

creating a reference to a logical resource that is associated with a corresponding physical

resource;

associating with the logical resource one or more private states that represents the most

recently configured settings of the logical resource; and

executing a plurality of functions that facilitate communication between the physical

resource and an algorithm.

12. The method of claim 11 wherein the reference comprises a pointer to the logical resource.

13. The method of claim 11 wherein the plurality of functions are selected from the group consisting of command functions that request and grant the identifier to the algorithm, configuration functions that pre-compute and store register values and algorithm settings, synchronization functions that align the logical resource with the physical resource, and a combination thereof.

14. The method of claim 11 wherein the plurality of functions comprise command functions that request and grant the identifier to the algorithm.

15. The method of claim 14 wherein the command functions comprise a function that monitors the physical resources and updates a corresponding vector table that associates the reference to a logical resource with a memory location of function optimized for a current operation.

16. The method of claim 14 wherein the command functions comprise a function that does not write to a register associated with the physical resource if a previous use of the physical resource has left the register in a state compatible with a current operation.

17. The method of claim 14 wherein the command functions comprise a function that branches to a function that is optimized for the configured settings based upon the a vector table that associates the reference to a logical resource with a memory location of the function that is optimized.

18. The method of claim 17 wherein the function that branches and the function that is optimized for the configured settings comprise functions with identical function signatures.

19. The method of claim 11 wherein the plurality of functions comprises configuration functions that pre-compute and store register values and algorithm settings.

20. The method of claim 19 wherein the configuration functions comprise a function that selects and stores an address of a function that is optimized for a current operation.

21. A storage medium comprising software that performs one or more operations that facilitate communication between a hardware unit and an algorithm, said software comprising:

instructions that create a reference to a logical resource that is associated with a physical resource of the hardware unit; and

instructions that associate with the logical resource at least one private state that

represents the most recently configured settings of the logical resource.

22. The medium of claim 21 wherein the reference comprises a pointer to the logical resource.

23. The medium of claim 21 wherein the plurality of functions are selected from the group consisting of command functions that request and grant the identifier to the algorithm, configuration functions that pre-compute and store register values and algorithm settings, synchronization functions that align the logical resource with the physical resource, and a combination thereof.

24. The medium of claim 21 wherein the plurality of functions comprises command functions that request and grant the identifier to the algorithm.

25. The medium of claim 24 wherein the command functions comprise a function that monitors the physical resources and updates a corresponding vector table that associates the reference to a logical resource with a memory location of function optimized for a current operation.

26. The medium of claim 24 wherein the command functions comprise a function that does not write to a register associated with the physical resource if a previous use of the physical resource has left the register in a state compatible with a current operation.

27. The medium of claim 24 wherein the command functions comprise a function that branches to a function that is optimized for the configured settings based upon the a vector table that associates the reference to a logical resource with a memory location of the function that is optimized.

28. The medium of claim 27 wherein the function that branches and the function that is optimized for the configured settings comprise functions with identical function signatures.

29. The medium of claim 21 wherein the plurality of functions comprises configuration functions that pre-compute and store register values and algorithm settings.

30. The medium of claim 29 wherein the configuration functions comprise a function that selects and stores an address of a function that is optimized for a current operation.